AMENDMENTS TO THE SPECIFICATION

Please replace Paragraph **[0002]** with the following paragraph rewritten in amendment format:

[0002] Numerous manual wheeled vehicles have been in use to assist in transporting materials from one place to another. **The age** ~~**[[Age]]**~~ old wheelbarrow is, of course, well known. However, aside from transporting alone, loading onto and unloading of materials from a vehicle easily and with minimum stress and strain to the human body have required different approaches. This has been true for shoveling or plowing snow, including wet and heavy slushy snow.

Please replace Paragraph **[0003]** with the following paragraph rewritten in amendment format:

[0003] In U.S. Patent 5,918,921, Samuelson shows a levered shovel for moving snow. The shovel includes a blade for carrying the snow, a shaft that extends from the blade, a wheel assembly for contacting a horizontal surface and which depends from the shaft, and a handle assembly for gripping by the user and which is disposed on the rearmost end of the shaft. The wheel assembly comprises either an axle fork, an axle rotatively mounted to the axle fork, and a pair of wheels attached to the axle or an inverted T-shaped member with its transverse portion serving as its axle to which a pair of wheel**s** are rotatively attached. The handle assembly comprises a lower transverse member for gripping by the hands of the user and extends laterally from both sides of the rearmost end of the shaft and an extender for elevating the point at which the user grips the handle assembly for users with limited bending posture.

Please replace Paragraph **[0008]** with the following paragraph rewritten in amendment format:

[0008] The present state of **the** ~~**prior of**~~ art, thus, generally provides two types of shovels which are particularly common. One type involves lifting and throwing of the snow, and the other involves pushing of the snow like plowing. These cited **patents** ~~**prior art references**~~ are incorporated by reference in their entirety. **As recognized by the inventor hereof,** ~~**[[W]]**~~**w**hat is needed **are** ~~**is a combination of the two types of**~~ snow shovels where the plowing type of action can be incorporated into a shovel which also lifts and throws the snow with ease and with **less** ~~**[[least]]**~~ ergonomical discomfort.

Please replace Paragraph **[0010]** with the following paragraph rewritten in amendment format:

[0010] An embodiment of the present invention involves an apparatus for removing and disposing materials. The apparatus comprises a wheel assembly having a rim and axle connected together with spokes radially projecting from the axle. The axle includes a fulcrum member capable of transmitting a recoil reaction to an action **applied at the axle**. A driving member has an upper portion, a middle portion and a lower portion. The middle portion is generally "S-shaped" and is attached to the fulcrum member of the axle. A handle is attached to the upper portion of the driving member and is capable of moving the wheel assembly. A blade is attached to the lower portion of the driving member.~~**[[, the]**~~ **The** blade **is** ~~**[[being]]**~~ adapted to pick up a load of material from a surface when the blade is lowered to the surface by raising the handle and pushing forward. When the handle is pushed downwards, the downward action causes the wheel **assembly** to compress and recoil through the fulcrum member at the axle of the wheel **assembly**. As a result, the blade springs upwards and forwards, thereby propelling the load of material briskly away from the apparatus.

Please replace Paragraph **[0011]** with the following paragraph rewritten in amendment format:

[0011] An aspect of the embodiment of the present invention comprises a wheel assembly having a rim and an axle, the axle further comprising a tubular body having two ends adapted to receive spokes which connect the axle to the rim. The axle further is adapted to receive a plurality of springs at the two respective ends of the axle to act as a fulcrum, and transmit a recoil reaction to an action applied at the axle. An elongate U-shaped driving member has a curved upper portion, a generally straight middle portion, and an open lower portion. The middle portion is attached to the springs at each end of the axle. A handle forms the upper portion of the driving member, **[[,]]** **The[[the]]** shovel blade **is** adapted to pick up material from a surface when the blade is lowered to the surface by raising the handle and pushing forward. The blade springs upwards and forwards, thereby releasing the material briskly away from the apparatus when the handle is pushed downwards to cause the springs to compress and recoil through the fulcrum member at the axle of the wheel.

Please replace Paragraph **[0012]** with the following paragraph rewritten in amendment format:

[0012] Another embodiment of the present invention involves a method **of method** of snow removal using an apparatus comprising relatively large wheel substantially at the waist level of an operator. A U-shaped yoke has a handle at a closed end, a shovel blade at an open end, and the yoke is mounted onto an axle of the wheel. The method involves an operator moving the apparatus along a path by pushing the handle and rolling the wheel in a direction

commanded by the handle. The operator shoves onto the blade a load of material along the path of the apparatus. After picking up the load of material, the operator presses the handle downwards, to lift the shovel blade to a level that clears the path; adjusts further the level of the shovel blade to achieve a balanced load with respect to and over the axle of the wheel; transports the balanced load of material to a destination; and at **the** destination, briskly applies body weight at the handle to propel the load of material to a substantial distance away from apparatus.

Please replace Paragraph **[0013]** with the following paragraph rewritten in amendment format:

[0013] Figure 1 is a three-dimensional embodiment of **an~~[[the]]~~** apparatus **according to one exemplary embodiment of** the present invention showing a relatively large wheel incorporated **in**to a driving member in the shape of a yoke, the yoke having a handle at one end and a shovel blade at the other, for picking up, transporting and disposing materials in general, and snow in particular**~~, according to the present invention~~**.

Please replace Paragraph **[0020]** with the following paragraph rewritten in amendment format:

[0020] Figure 8 is a schematic drawing of an aspect of an embodiment of the present invention showing blade rollers employed for ease of travel of the blade over rough ground, such as **a** gravel surface, according to the present invention.

Please replace Paragraph **[0022]** with the following paragraph rewritten in amendment format:

[0022] Reference numeral 10 in Figure 1 generally refers to an apparatus representing an embodiment of the present invention

comprising a wheel assemble 100, a driving member 110, resembling substantially a U-shaped yoke having a handle 133 at its closed **end** and a shovel blade 120 attached to its open end, wherein the yoke is mounted onto **the** axle 190 of the wheel. The wheel and the blade are incorporated into the driving member in a manner that the blade rests on the ground in its normal position. An operator uses the handle to move the shovel in any direction by rolling the wheel on the ground. The operator also uses the handle to guide the shovel in shoving into the blade material lying along **the blade's**~~[[its]]~~ path. The operator then lifts the shovel blade off the ground to pick up a load of material, followed by further lifting to balance the load at a comfortable walking posture. At **the desired** destination, the operator presses on the handle with a quick downward body (or arm) motion, to propel the load away from the shovel. The operator can dispose the material either straight ahead by directing the shovel in the direction of the motion of the apparatus, or to the side by flipping the shovel sideways.

Please replace Paragraph **[0023]** with the following paragraph rewritten in amendment format:

[0023] It will be appreciated by those skilled in the art and by ordinary users of snow shovels that the large wheel 100 shown in Figure 1 (as further defined below and depicted in **Figure** ~~[[*Fig.*]]~~ 3 relative to human dimensions) enables a user to lift **the blade** and snow **thereon** ~~**and blade**~~ above **the** unshoveled snow height and travel **over the unshoveled snow or other** ~~[[it and]]~~ rough surface without compressing the unshoveled snow within the unshoveled area to be traversed. The relatively high level handle of the shovel enables the user to comfortably accelerate forward the load of snow off the blade while pushing down the handle, which enhances the throw distance of the snow trajectory.

Please replace Paragraph **[0024]** with the following paragraph rewritten in amendment format:

[0024] The wheel assembly 100, driving member 110 and shovel 120 are formed ergonomically to assist in picking up and releasing a heap of material 160, such as sand, gravel or snow, generally aligned in the direction of motion, with **less** ~~[[least]]~~ stress to the body of the operator, and especially to **help** prevent back stress or injury. As will be explained more in detail later in an embodiment of the present invention, a recoil assist is provided to the action of the operator of the apparatus from a fulcrum area of the apparatus to release the material in a brisk and efficient manner. The material can also be picked up and released while the wheel is stationary. Furthermore, the material can be throwingly released, or propelled, forward or sideways, as desired, while the wheel is stationary or in motion.

Please replace Paragraph **[0026]** with the following paragraph rewritten in amendment format:

[0026]In an aspect of the embodiment shown in Figure 1, the driving member 110 is formed in an elongate U-shaped, resembling a yoke, with an upper portion providing the handle 133, and a narrowed middle portion 140 with distal sides to accommodate the axle **190**~~[[125]]~~ of the wheel assembly 100. The distance between the relatively long legs (encompassing generally the middle portion 140) of the U-shaped driving member 110 is determined by braces 117, 119 and 157 formed judiciously between the legs so that the axle fits in the fulcrum areas 145. It will be known to those skilled in the art that any number of different ways can be employed to attach the axle of the wheel in the openings forming the fulcrum areas 145. For example, the well-known quick release for bicycle wheels

can be employed. Or, the axle, in the form of a tube having protrusions ~~[[195]]~~ with inside shoulders (not shown) can be snapped into openings 145 by gently spreading apart the legs 140 of the U-shaped driving member. These wheel mounting features are well known in the art and as they are not significant to the invention, they are not described in detail here in order not to unnecessarily obscure the present invention. It is preferred that the tubing material for the driving member 110 comprises hollow aluminum, or other metal tubing. Non-metal materials, such as plastics may also be used.

Please replace Paragraph **[0028]** with the following paragraph rewritten in amendment format:

[0028] In still another aspect of an embodiment of the present invention shown in Figure 4, it is preferred that the wheel diameter a is between about 30 to 36 inches, while the height of handle **133**~~[[110]]~~ from a datum plane directly under the wheel, that is, from a ground datum x, is between about 48 to 60 inches. The height of handle 133 from the center of axle 195 is preferable between about 26 to 42 inches. In another aspect of the present invention, further adjustment of the height of the handle is provided by a telescoping means 115, such as a sliding hollow outer tube over an inner tube as shown in Figure 3, which ensures better ergonomic comfort. The **overall** ~~[[over-all]]~~ length d of the wheeled shovel is between about 78 to 88 inches. Distance e from the tip of the shovel blade 120 to the fulcrum area 145 near the center of the wheel assembly 100 is between about 32 to 42 inches. Distance f from the fulcrum area to the tip of the handle shown in Figure 4 can be varied depending upon the preferences on the part of the operator. For example, distance f can be adjusted to make it easier to pick up and lift a load, balance the load on the apparatus more

evenly for ease of transport to a location, and/or to gain more leverage in shoving the load from the shovel at the location of interest.

Please replace Paragraph **[0029]** with the following paragraph rewritten in amendment format:

[0029] Thus, it will be apparent to those skilled in the art that the relationship between the relatively large diameter of the wheel, **overall** ~~[[over-all]]~~ length of the shovel and the height of the shovel handle from the ground determine the ease with which snow may be shoveled. The ~~chest-high~~ position**ing** of the handle **generally between the operator's chest and waist (as shown in Figure 3) (which may vary depending on the height of the operator and conditions, such as depth of snow, etc.)** assists in pushing the accumulated snow or other material that is being shoveled. A ratio **greater** ~~[grater]~~ than 1:1 between the length of the yoke and the height of the handle provides the ease with which a blade full of snow can be lifted as the handle is lowered. This leverage ratio can be varied by varying the point at which the yoke connects to the axle. Furthermore, differently shaped yokes, such as shown in Figures 4 and 5, contribute differently to the efficiency of the shovel. A preferred "S-shaped" yoke is shown in Figure 6, and will be described in more detail later in the preferred embodiments of the present invention.

Please replace Paragraph **[0030]** with the following paragraph rewritten in amendment format:

[0030] In addition to the ergonomic advantages, the embodiments of the present invention provide enhanced functional performance through a judicious use of a fulcrum line formed at the central portion of the wheel assembly show in Figure 5. Line x' passing

through the center of the fulcrum area 145 parallel to the ground datum line x forms the fulcrum line. A force F applied to the fulcrum through an action at the handle 133 can be resolved into a horizontal component F_n and a downward vertical component F_v, as shown in Figure 5. With no substantial resistance to the horizontal component F_n the wheel rolls to the left, in accordance with the direction of the applied force F shown in Figure 5, while the ground under the wheel reacts to the downward component F_v giving rise to an upward recoil reaction $-F_v$ by the wheel. A brisk and mostly downward action on the handle, using arm and/or body weight, for example, produces a recoil assist to the throwing power. The magnitudes of the component vectors are determined by angle β, of the transmittal force F substantially by an angle Θ. Angle Ω contributes to the throwing power. Furthermore, the shovel blade **120** can be formed in different configurations to assist in efficient release of material 160 from the shovel. For example, the shovel blade can have a bottom portion with a relatively large radius of curvature ρ, resembling a scoop, for easy **sliding** ~~[[slide]]~~ of material from the shovel, as well as for keeping the material form sliding backwards and spilling off the shovel. It will be appreciated by those skilled in the art that these various parameters can be set to values that are commensurate with the ergonomic and functional requirements of the apparatus of the present invention.

Please replace Paragraph **[0031]** with the following paragraph rewritten in amendment format:

[0031] Figure 6 illustrates a preferred embodiment of the invention with similar characters and numerals referring to similar parts throughout the several views. The side-view of the yoke shown in Figure 6 has an upper portion 130, middle portion 140 and a lower portion 150. The yoke is attached to wheel 170 (shown in phantom)

at its axle ~~[[195]]~~ (not shown) in a notch O of a slideable sleeve 143. Sleeve 143 can be slid (in the direction of either one of the arrows shown in the same figure) over portion 150 of the yoke to change the position of fulcrum 145, the effective leverage length f and the "throw arm" e. The throw is accomplished by pushing handle 133 in a downward direction to the phantom position 133'. The primed reference numerals, namely, 130', 135', 140',150' and 120', show other parts of the yoke 110, including the shovel blade, in a position following the downward motion of the handle of the yoke **110**. It will be understood by those skilled in the art that various different mechanisms can be used to adjust the fulcrum point to achieve the desired leverage for throwing the load off the shovel.

Please replace Paragraph **[0033]** with the following paragraph rewritten in amendment format:

[0033] In another aspect of the present invention, the handle portion 133 shown in Figure 6 has a shank 134, which slideably and rotatably fits inside hollow sleeve section 135. Handle 133 can be pulled out, pushed in and/or rotated in order to find the most ergonomic position for shoving, picking up and throwing a load from the shovel. Shank 134 can be slid to any one of continuous positions along sleeve 135 by utilizing friction hold against the inside surface of the hollow sleeve 135. However, pins 137 are preferred which engage holes 139 judiciously placed along the length of section 135. Length E along handle 133 is between 12 to 18 inches, while length L along section 135 is between 16 to 24 inches, although other lengths can also be used. The over-all length d of the shovel apparatus can be increased by Δ_d, preferably between 6 to 12 inches, while the **overall** ~~[[over-all]]~~ height c can be increased by Δ_c preferably between about 4 to 8 inches, thus

yielding an **overall** ~~[[over-all]]~~ length G between about 89 to 100 inches and **overall** ~~[[over-all]]~~ height X between about 42 to 66 inches. With the preferred dimensions cited here, the shovel blade can be comfortable raised to a height between about 36 to 44 inches.

Please replace Paragraph **[0034]** with the following paragraph rewritten in amendment format:

[0034] In another aspect of the present invention, a plurality of springs 200 (only one shown in the side view in Figure 7) are utilized to provide an enhanced recoil reaction at the fulcrum line when the tire used for wheel 170 is not flexible as for example, a bicycle tire with a pneumatic tube. In Figure 7, axle 190 is adapted to receive one spring at each of the two respective ends 195 of the axle which act as a fulcrum and transmit a recoil reaction to **the** shovel blade **120** from an action applied at the axle **190**.

Please replace Paragraph **[0035]** with the following paragraph rewritten in amendment format:

[0035] In still another aspect of the present invention, rollers 210 are attached to the bottom of shovel blade 120 for ease of traversing over rough ground surface 220, such as gravel, as shown in Figure 8. It will be obvious to those skilled in the art that rollers will also reduce friction with the ground, especially as more load accumulates on the shovel while the shovel is being pushed forward to pick up more material, such as snow, from the ground. Similar rollers with similar reference numerals are shown in Figure 6 where the primed numeral corresponds to the position of the rollers when shovel **blade** 120 is elevated. As seen in Figure 6, the shovel **blade** to which the roller is attached has a lateral dimension P between about 15 to 18 inches.

Please replace Paragraph **[0036]** with the following paragraph rewritten in amendment format:

[0036] The embodiments of the present invention shown in Figures 1-8 are adaptable for various enhancements and improvements in useful ways. For example, a shovel blade may be designed with a more flexible material to enhance the ability to throw the shovel load. The flexibility of the blade would provide a trampoline effect as the blades flexes back to its original shape from a bent shape as it accelerates to unload the load. A comparable effect is obtained by attaching the shovel blade to the shovel yoke with a spring-loaded hinge (not shown) that enhances the throwing capacity of the wheeled shovel. Furthermore, shovel blade 120 is fitted with side walls 125 as shown in Figure 3 in order to be able to pick up and retain liquid like substances, such as snow slush. In another aspect, the driving member, resembling a yoke, is made to fold at the fulcrum area where a quick release wheel is mounted and removed readily for ease of transporting the apparatus. As an alternative, the driver member comprises two halves (not shown) attached to each other at the fulcrum area 145 of Figure 1. It will also be understood that a plurality of wheels of various widths can be used instead of the one wheel shown in Figures 1-8 of the present invention. Further, the apparatus can be motorized to pick up, transport and propel a load of material from the wheeled shovel of the present invention. Also, motor energy can be utilized to store energy in a spring or in **an**other energy storing device, which in turn can be used on demand to assist in pushing and/or throwing the load on the shovel.